Chapter 5
WATER QUALITY

GOALS

The State of Florida has stated the following water quality goals:

- It is declared to be the public policy of this state to conserve the waters of the state and to protect, maintain, and improve the quality thereof for public water supplies, for the propagation of wildlife and fish and other aquatic life, and for domestic, agricultural, industrial, recreational, and other beneficial uses, and to provide that no wastes be discharged into any waters of the state without first being given the degree of treatment necessary to protect the beneficial uses of such water (Section 403.021(2), F.S.).
- Florida shall . . . maintain the functions of natural systems and the overall present level of surface and ground water quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards (*State Comprehensive Plan*, Section 187.201(8)(a), F.S.).
- The *State Comprehensive Plan* (Chapter 187, F.S.) states as a goal that Florida "shall maintain the functions of natural systems and the overall present level of surface and ground water quality."

The SFWMD has the following related water quality goals:

- Protect and improve surface water quality
- Protect and improve ground water quality

RESOURCE ASSESSMENT

Surface Water Quality

A number of ongoing activities are under way throughout the District to assess and improve surface water quality. These include cooperative agreements with other agencies, landowners, and local governments.

Statewide Water Quality Assessment Program

Every two years, since 1978, the Florida Department of Environmental Protection (FDEP) produces a *Florida Water Quality Assessment 305 (b) Report*. Preparation of this report was first required by the Clean Water Act in 1975 to provide an assessment of the quality of Florida's waters every two years. It is divided into a Main Report and Technical

Appendices. The Main Report provides a summary of water quality by water body type and identifies sources and causes of pollution for each water body type. The report also summarizes pollution prevention programs, management programs, restoration and rehabilitation activities, monitoring activities, and provides an evaluation of ground water quality. Although emphasis of the report has been primarily placed on surface water resources, general ground water quality data are also included. The most recent version of the report summarizes data available through 1998 (Paulic and Hand, 1998). The assessments are made based on data available from the U.S. Environmental Protection Agency's (USEPA) computerized STORET water quality data base. Water quality conditions are characterized based on the following criteria:

- Water quality indices
- Biological and chemical data
- Occasions when Florida water quality standards were exceeded
- Fish consumption advisories
- Analysis of statistical trends
- Information from special studies
- Interviews with local experts

Although conclusions of the report need to be qualified for some locations due to limited data, the report provides a primary means for the water management districts to gauge progress made toward improving water quality conditions within their regions. Results of the most recent assessment have been reported each year in the *District Water Management Plan Annual Report* (SFWMD 1996, 1997a, 1998a).

Water Quality Monitoring Network

The SFWMD maintains a water quality monitoring network for surface waters within its boundaries. Surface water samples are analyzed for numerous parameters. These parameters are divided into six major groupings: physical, nutrients, major ions, trace metals, pesticides, and priority pollutants. The frequency of sampling for each parameter varies for each sampling station.

The monitoring network is comprised of almost 40 major water sampling programs that include 991 sampling locations and encompass a wide variety of South Florida's ecosystems, urban, and agricultural uses including lakes, rivers, estuaries, canals, wetlands, dairies, and cattle ranches. Locations of the primary water quality sampling efforts are shown in **Figure 25**.

Data collected from routine monitoring programs are often used to supplement more specific water quality studies. The District also has archived data from historical stations in the water quality database. The monitoring program is designed to directly support the following legislative acts, permits, agreements, and technical advisory committee recommendations:

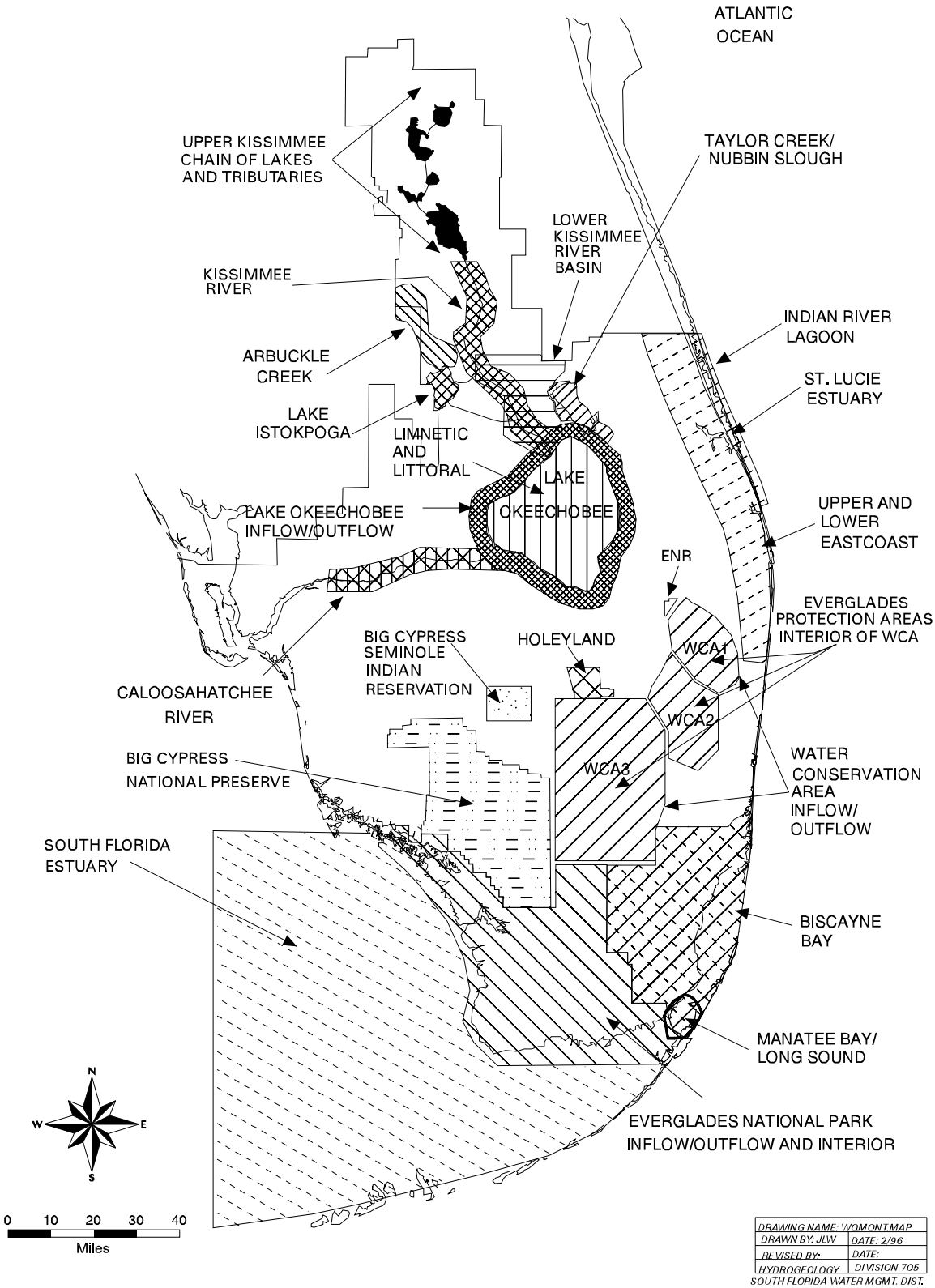

Figure 25. Locations of SFWMD Surface Water Quality Monitoring Programs.

- The Surface Water Improvement and Management (SWIM) Act
- Permits issued by the FDEP and the USEPA
- The Memorandum of Agreement (MOA) between the Everglades National Park, the SFWMD, and the U.S. Army Corps of Engineers (USACE)
- MOAs between the District and the Seminole Tribe of Florida
- The MOA between the SFWMD, the U.S. Department of Agriculture (USDA), and the USEPA

The District's major water quality monitoring programs are categorized under two broad networks: inorganics and pesticides/organics. Sampling methods and frequencies vary according to the project plan. Sample sites are accessed using trucks, boats, airboats, or helicopters. Sample collection frequencies range from weekly to annually. The District's chemistry laboratory performs physical parameters, nutrients, metals, major ions, and microbiological tests. All analytic and data processing procedures are conducted in conformance with a Quality Assurance Plan that has been approved by the FDEP. All data are reviewed thoroughly to ensure high quality prior to the final archiving into the historical water quality database.

In the future, the District will need to collect and process increasing amounts of information to meet monitoring requirements of the extensive water management facilities within District boundaries, as well as to meet the data needs for adaptive management of restored systems that are being instituted. Data collection and processing needs for these programs should be included in the overall program cost. District data collection procedures and equipment need to become much more efficient and effective. The District already gathers more data than it can effectively interpret and thus much of the data collected never gets analyzed. Conversely, the District's level of confidence in its models would be significantly improved by data which is not presently being gathered. To address these needs, a comprehensive data audit is needed to specify formats, processing tools, etc., and determine how the District's data gathering efforts need to be modified.

Regulatory Programs

Since 1974, pursuant to the Water Resources Act of 1972 (Chapter 373, F.S.), the SFWMD has regulated the management and storage of surface waters within its boundaries. Generally, permits are required for construction, alteration, operation, or maintenance of local surface water management systems. The SFWMD evaluates both the flood protection provided by the proposed system, as well as its effect on water quality. Additional information regarding the SFWMD's permitting program for the management and storage of surface waters may be found in the **Wetlands Regulation** section of **Chapter 6**.

In 1987, the state enacted the SWIM Act. The SWIM Act required Florida's water management districts to develop plans that contain strategies to either protect undisturbed natural water bodies or restore impacted areas. The SWIM Act, and subsequent enabling

legislation, provided the framework for establishment of two new District regulatory programs. These programs are the Lake Okeechobee Works of the District and the Everglades Works of the District.

The Lake Okeechobee Works of the District Permit Program is a performance-based phosphorus control program implemented by the District in 1989. Key features of the program involve regulation of land uses (excluding dairies) greater than 0.5 acre in size, in order to control phosphorus in surface discharges. Off-site discharge concentration limitations are set for each parcel based on land use, and permitted parcels are monitored for compliance. Corrective actions by the land owner are required for noncomplying parcels. Since implementation of this program, the initial permitting of the basins has been completed. The focus has now shifted to implementation of appropriate corrective measures for those parcels found not to be in compliance with the permitted off-site discharge limitations.

The Everglades Works of the District Permit Program was implemented in 1992 pursuant to the provisions of the Marjory Stoneman Douglas Everglades Protection Act of 1991 (Chapter 373.4592, F.S.). It requires all Everglades Agricultural Area (EAA) landowners holding property that discharge water to District works to obtain a Works of the District permit, implement Best Management Practices (BMPs), and monitor the quality and quantity of waters discharged from their lands into the District's works.

Three major new regulatory activities are scheduled for initiation during the next few years:

- Implementation of rulemaking for the C-139 Basin
- Works of the District permitting for the five Chapter 298 drainage districts that are located south of Lake Okeechobee
- The St. Lucie Estuary BMP Program

However, staff limitations may necessitate postponement of these efforts.

Storm Water Management Levels of Service

The Growth Management Act requires local governments to develop and adopt comprehensive plans that specify levels of service for public facilities and services, including storm water management (Section 163.3177, F.S.). While the primary focus of local government storm water level of service has historically been flood protection, the SFWMD has encouraged local governments to adopt a level of service that also addresses water quality.

The District has worked with the Department of Community Affairs to ensure that local governments address both components of storm water management level of service through the comprehensive plan review process. The SFWMD permitting criteria also require that storm water management systems be designed to protect against both water quality degradation and flood damages.

The District intends to work more closely with local governments in the future to encourage the development and implementation of Storm Water Master Plans that will address specific local storm water management requirements. The District is prepared to provide technical assistance and review of draft plans in order to encourage these efforts.

Pollutant Load Reduction Goals

State water policy (Section 62-40.432, F.A.C.) requires that water management districts establish storm water management goals on a watershed basis, including watershed Pollution Loading Reduction Goals (PLRGs). The primary purpose of PLRGs is to reduce pollutant discharges from watersheds such that the water quality in receiving waters is restored or maintained consistent with applicable state water quality standards.

The concept of setting PLRGs is based on the idea that when the inflow rate, or loading, of a pollutant exceeds some critical value, the concentration in the receiving water will build up to a level that creates either a biological problem within the ecosystem or a threat to human health. Below the critical loading, the pollutant concentration is kept at acceptable levels by chemical or biological breakdown and flushing of the system. Thus, full implementation of the PLRG concept requires an understanding of the dynamics of pollutant loading and removal for the water body, as well as knowledge of the lowest concentration at which unacceptable biological effects will occur.

For Lake Okeechobee, PLRGs have been established with regard to phosphorus loadings and subsequently approved by the Florida Legislature (Section 373.4595, F.S.). As part of the Everglades Forever Act, a phosphorus criterion for the Everglades Protection Area will be established through research. Within the SFWMD portion of the Indian River Lagoon, the District has established an interim PLRG for salinity (total freshwater releases) to the St. Lucie Estuary. An interim PLRG has also been established for turbidity levels in Biscayne Bay.

Much work remains to be done before final PLRGs can be established for SWIM water bodies within the SFWMD. Information regarding how interim PLRGs were determined may be found in each of the respective SWIM plans. In some cases, the interim PLRGs represent feasible reductions based on present and historical concentrations rather than actual loadings, though they may still be too high to provide long-term protection. Taking such a conservative approach is, however, considered to be the most effective path toward establishing meaningful PLRGs. PLRGs will be established for additional high priority areas within the District as SWIM or other special water quality studies are developed.

Total Maximum Daily Loads

The federal requirement to establish Total Maximum Daily Loads (TMDLs) and the state requirement for PLRGs are similar in concept, but the processes and details for establishing these criteria are different. Section 303(d) of the Clean Water Act requires states to submit lists of impaired waters, i.e., surface waters that do not meet applicable water quality standards, and to establish TMDLs for pollutants for these waters. A TMDL

represents the maximum amount of a pollutant that a water body can assimilate without causing water quality standards to be exceeded. Both point source and nonpoint source components must be considered.

Implementation of TMDLs will include a combination of regulatory and/or incentive-based actions that reduce pollutant loading below the set maximum daily level. Incentive-based or nonregulatory actions may include development and implementation of BMPs, pollution prevention activities, and habitat preservation or restoration. Regulatory actions may include issuance or revisions of wastewater, storm water, or Environmental Resource Permitting (ERP) to include permit conditions consistent with the TMDL. These permit conditions may be numeric effluent limitations or, for technology-based programs, requirements to use a combination of structural and nonstructural BMPs needed to achieve the required pollutant load reduction.

The FDEP's Division of Water Resource Management is developing a framework document to detail the Watershed Management Program. This program will develop TMDLs for impaired waters. It will assess, monitor, and implement management activities in the state's river basins on a five-year rotating cycle. The Watershed Management Program is being designed to complement other watershed management initiatives produced by the state and the water management districts. The FDEP, with cooperation from the District, is in the process of developing a TMDL for phosphorus for Lake Okeechobee.

Surface Water Improvement and Management Programs

Since the SWIM Program was initiated in 1987, the SFWMD has prepared a priority list of all water bodies within the District (**Table 13**). Within **Table 13**, the A list represents immediate priorities. SWIM plans have been prepared for Lake Okeechobee, the Everglades, Biscayne Bay, and Indian River Lagoon. Efforts have been initiated for non-SWIM water quality plans for the Florida Keys and the Kissimmee Chain of Lakes. The Everglades SWIM Plan was superseded by the Everglades Forever Act. Since 1995, legislative appropriations for the SWIM Program have declined dramatically, although the mandate to conduct the program still exists. Some of the shortfall has been supplemented by the use of ad valorem funds and matching money from local interests. An alternative source of funding for SWIM is needed to continue the ongoing efforts and develop plans for additional SWIM priority water bodies.

In 1998, the Florida Legislature passed the Florida Forever Act (S.B. 908), creating Section 259.202, F.S. This program was intended to authorize the continued purchase of lands and interests in lands of the type acquired through the Preservation 2000 Program, but focuses on additional priority needs of the state. One of these needs is to acquire parcels needed to facilitate implementation of SWIM plans (Chapter 259.202(2)(d), F.S.). The Florida Forever Act also provides a dedicated source of funds for SWIM projects. This act amends Chapter 201.20(6), F.S., to state that four percent of taxes collected under this chapter shall be paid into the state treasury to the credit of the SWIM Trust Fund and shall be used by the water management districts for fixed capital

Table 13. SWIM Priority Water Body List.

Priority Number	Water Body
A List	
1	Lake Okeechobee/Kissimmee River
1	Biscayne Bay
1	Indian River Lagoon
1	Everglades Everglades National Park/Florida Bay Water Conservation Areas (WCAs) East Everglades Holey Land and Rotenberger wildlife management areas
5	Upper Kissimmee Chain of Lakes Lake Tohopekaliga East Lake Tohopekaliga Lake Kissimmee Alligator Lake Lake Jackson Lake Rosalie Cypress Lake Lake Hatchineha Lake Pierce Lake Marian Three Lakes Ranch Fish Lake
6	Florida Keys
B List	
7	Lake Weohyakapka
8	Caloosahatchee River Estuary
9	Big Cypress National Preserve
10	Lake Arbuckle
11	Corkscrew Swamp
12	Naples Bay/Gordon River
13	Estero Bay
14	Lake Butler
15	Pine Island Sound/Matlacha/Ding Darling
16	Lake Istokpoga
17	Lake Worth
18	Loxahatchee River
19	Rookery Bay/Marco
20	Lake Trafford
21	J.W. Corbett National Wildlife Management Area
22	Savannas State Reserve

outlay projects, including wastewater treatment and storm water management facilities, and for implementing SWIM plans in effect on July 1, 2000.

Section 373.59(4)(b), F.S., was added to the Florida Forever Act. It states that each water management district governing board shall annually adopt, and may amend as needed, a priority list of fixed capital outlay projects, including wastewater treatment and storm water management facilities, needed to implement SWIM plans in effect on July 1, 2000, and that funds for such projects shall be available from the SWIM Trust Fund.

The SWIM Act required water management districts to develop prioritized lists of water bodies within their jurisdictions from which SWIM plans and projects would be initiated. Chapter 62-43, F.A.C., specifies that the criteria to be used to establish priority lists must include water quality, biological and physical conditions, threats to use, protection of outstanding water bodies, coordination with local planning efforts, and feasibility.

The SFWMD coordinated its priority setting process with the FDEP, the Florida Fish and Wildlife Conservation Commission[1] (FWC), and local governments. Public input was also solicited. The first step of the process was to develop an inventory and map the locations of water bodies throughout the District. A water body was placed in the inventory only if it was publicly owned and was greater than 140 acres. The final inventory included 384 lakes, estuaries, canals, streams, and rivers. Priorities were established on the basis of four factors:

1. Water quality of lakes and estuaries or general conditions of wetlands
2. State Water Quality Classification I, II, III, or Outstanding Florida Water
3. Public use
4. Habitats that are essential to the survival of wildlife resources

Funding constraints and staff limitations dictated the following criteria for creating and implementing new SWIM plans: more than half of the material needed to create a SWIM Plan must be available in a readily usable form and another agency must be willing to be a full partner in development and implementation of the plan.

Ground Water Quality

The SFWMD's policies for ground water quality, as related to water supply, were accepted by the District's Governing Board in 1991 as part of the *Water Supply Policy Document* (SFWMD, 1991). The primary objective is to manage regional ground water to protect the resource and meet the full range of natural systems and human water needs. Water quality standards, including those for ground water, are developed by the FDEP and

1. The Florida Fish and Wildlife Conservation Commission (FWC) was formerly known as the Florida Game and Fresh Water Fish Commission (FGFWFC).

adopted by the Environmental Regulatory Commission. The FDEP has responsibility to ensure that these standards are enforced.

The primary strategies for ground water management by the District and FDEP, which address both water quality and quantity issues, include the following:

- Assessments of ground water conditions, including water levels, contamination, and saltwater intrusion, throughout the District
- Identification and characterization of recharge areas
- Permitting activities
- Cooperative efforts with other government entities, local interests, and utility companies to develop well protection ordinances

The SFWMD and FDEP compile ground water quality data from throughout South Florida to provide periodic assessment of regional conditions and problem areas. The District has also identified recharge areas within its boundaries and identified the relative rates of recharge that occur in different areas. Locations of ground water sampling sites are shown in **Figure 26**.

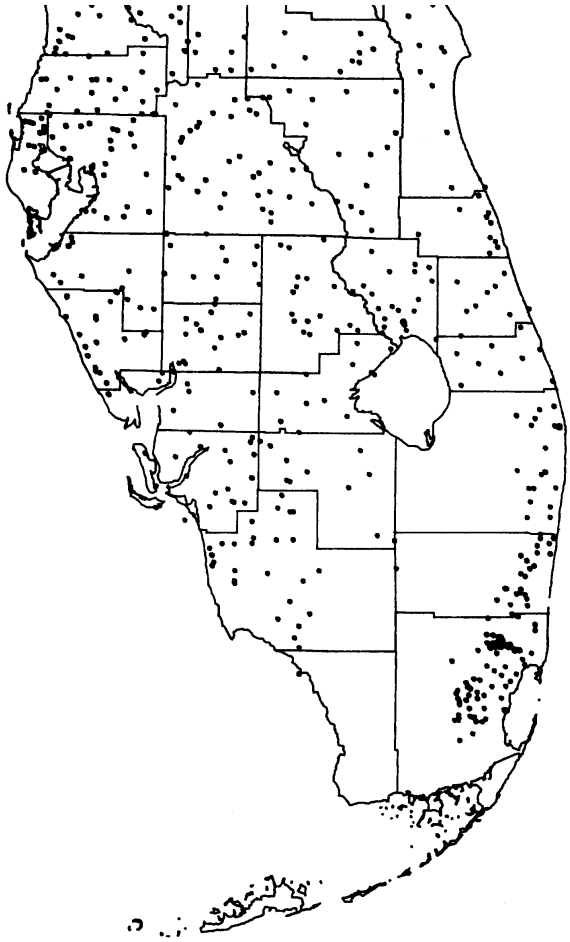

Figure 26. Background Monitoring Network Sampling Sites for Ground Water Quality in South Florida.

Through the Consumptive Use Permitting (CUP) Program, the SFWMD regulates ground water quality issues associated with water withdrawals. In general, the ground water quality aspect of permit review focuses on the potential for pollution of water resources and on saltwater intrusion. The issuance of a consumptive use permit shall be denied if the withdrawals would cause significant degradation of surface or ground water quality through the induced movement of pollutants into a water resource that is not polluted. Significant water quality degradation may result from altering the rate or direction of movement of pollutants. Similarly, a consumptive use permit is subject to denial if the application requests freshwater withdrawals that would cause significant saltwater intrusion. Significant saltwater intrusion includes the following:

- Movement of the saline water interface to a greater distance inland or vertically upward towards a freshwater source that has historically occurred as a result of seasonal fluctuations
- A sustained increase from background values of saline monitor wells with regard to dissolved chloride concentrations

During the District permit review process, the following potential impacts are routinely assessed to determine impacts due to pollution or saltwater intrusion:

- Saltwater intrusion
- Upconing of saline water
- Movement of nonsalt pollutant sources
- Spread of contamination from a point or nonpoint source through expansion of a cone of depression
- Changes in the hydroperiod and impacts in the natural treatment capacity
- Interaquifer exchange associated with well construction

Efforts are underway to streamline the CUP process and, thereby, reduce the amount of staff time required to process a permit. This will be accomplished by automating certain aspects of the permit application and review process, and by encouraging electronic filing of permit applications.

Land use decisions by local governments can impact ground water quality directly. In recognition of this, the District will continue to encourage local governments to consider water quality concerns in their comprehensive plans, especially as they relate to land use decisions. The District will, in its review of local government comprehensive plans, comment negatively on local government land use proposals which are not consistent with wellfield protection and aquifer recharge protection criteria. The District also will provide technical and other assistance to local governments to help identify recharge areas within local jurisdictions, wellfield protection zones, and appropriate wellfield protection ordinances.

ISSUES

The District funds and implements numerous activities to maintain and improve surface and ground water quality. The main issues are summarized as follows:

Issue 1. Water quality of surface waters has been degraded by human activity. Effective efforts must be implemented to protect and improve these resources by the following:

- Identifying and implementing the best procedures and management practices available to eliminate point and nonpoint sources of pollution

- Obtaining resources needed to restore and improve water quality in identified problem areas
- Establishing appropriate levels of discharge of pollutants to surface waters based on TMDLs and/or PLRGs
- Expediting Phase II of the Everglades Construction Project (ECP)

Issue 2. Ground water provides the major source of drinking water throughout the SFWMD and is the source of water for many natural rivers, streams, and wetlands. Ground water quality is threatened by human activities and must be protected and improved by the following:

- Eliminating point and nonpoint pollution and excessive withdrawals
- Establishing appropriate priorities and obtaining funds necessary to restore and improve ground water quality in identified problem areas
- Improving monitoring and source protection efforts

Objectives, Strategies, and Performance Measures

Core Objective WQ 1: Protect and improve surface water quality

The SFWMD has developed strategies to meet this core objective. The strategies will be implemented via budgeted activities in the categories of Planning, Public Works Construction, Regulation, and Monitoring and Evaluation (**Table 14**).

Performance Measures for Objective WQ 1

- **Core WQ 1(a):** Percentage of water segments that fully meet, partially meet, and do not meet their designated uses
- **Core WQ 1(b):** Number and percentage of SWIM water bodies with approved SWIM plans for which Pollutant Load Reduction Goals (PLRGs) have been established
- **Core WQ 1(c):** Percentage of total stream miles and lake and estuary area in the District assessed for ambient water quality
- **SFWMD WQ 1(d):** Number of SWIM plans being implemented according to SWIM plan schedules
- **SFWMD WQ 1(e):** Number and percentage of permitted systems inspected through the ERP Program, and percentage of those inspected found in compliance with permit conditions

Table 14. Activities Table for Core Objective WQ 1.

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Core Objective WQ 1: Protect and improve surface water quality				
Planning				
Fe01	Kissimmee Basin Basic Plan Development	The SFWMD has consistently identified the Upper Kissimmee Chain of Lakes as a priority for water quality plan development. Development of such a plan identifies and prioritizes issues and efforts which provide efficiency for budget prioritization.	2001	SFWMD
Pa03	Florida Bay Feasibility Study	This is a feasibility study to comprehensively evaluate Florida Bay and to determine the types of modifications that are needed to successfully restore the water quality and ecological conditions of Florida Bay.	2004	SFWMD
Pa04	Comprehensive Integrated Water Quality Plan	The Comprehensive Integrated Water Quality Plan for South Florida involves identifying pollution-impaired water bodies, quantifying types and sources of pollution, establishing interim and final pollution load reduction targets necessary to achieve ecosystem restoration, recommending potential source reduction programs, developing baseline and future water quality monitoring programs to assess ecological responses to water quality changes, and constructing water quality treatment facilities.	2006	SFWMD
Ej	Florida Keys Water Quality Plan	The strategies identified in the Florida Keys Water Quallty Plan focus on eliminating water quality problems that are related to land-based activities in the Florida Keys. These problems may be caused by inadequate or nonexistent treatment of storm water runoff and wastewater. The plan builds upon several other plans, notably the Water Quality Protection Program and the Management Plan for the Florida Keys National Marine Sanctuary, and focuses on restoration strategies and projects that could be initiated or assisted by the District.	Ongoing	SFWMD
Ja20	Indian River Lagoon SWIM Plan Documentation	This activity involves an update of the *Indian River Lagoon Surface Water Improvement and Management Plan* (SFWMD and SJRWMD, 1994). The Indian River Lagoon SWIM project, a joint program administered with the St. Johns River Water Management District, is designed to develop and execute a combination of research and practical implementation projects to protect or restore the environmental resources of the St. Lucie Estuary and the Indian River Lagoon. The program has three goals: 1) attain and maintain water and sediment of sufficient quality to support a healthy, seagrass-based, estuarine ecosystem; 2) attain and maintain a functioning seagrass ecosystem which supports endangered and threatened species, fisheries, and wildlife; and 3) achieve heightened public awareness and coordinated interagency management. The focus of this effort has been on the improvement of water quality entering the estuary and lagoon, in terms of quantity, timing, and distribution of fresh water, and the associated suspended materials and nutrients that are transported into the system.	Ongoing	SFWMD
Ib01	Lake Okeechobee SWIM Plan Implementation	This activity includes work required to insure that the *Lake Okeechobee Surface Water Improvement and Management Plan* (SFWMD, 1997b) is being implemented as intended.	Ongoing	SFWMD

Table 14. Activities Table for Core Objective WQ 1. (Continued)

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Public Works Construction				
Pb06	Lake Okeechobee Water Retention/ Phosphorus Removal	The South Florida Ecosystem Restoration Working Group ranked this project number ten on the list of critical restoration projects to be implemented under the USACE's authority provided in Section 528 of the 1996 Water Resources Development Act. This project was also recommended within the *Lake Okeechobee Surface Water Improvement and Management Plan* (SFWMD, 1997b) to reduce phosphorus loading to the lake. This project includes two reservoir-assisted Stormwater Treatment Areas (STAs) and plugging of select local drainage ditches. The other portion of this feature includes the purchase of conservation easements within four key basins of Lake Okeechobee to restore the hydrology of isolated wetlands by plugging the connection to drainage ditches and the diversion of canal flows to adjacent wetlands.	2002	SFWMD
Pb07	Western C-11 (S-9) Water Quality Treatment Project	This project includes preconstruction engineering and design, real estate acquisition, and the construction of 1) a gated control structure on the C-11 Canal to divide western seepage waters from the eastern runoff waters in the canal and 2) an additional pump station adjacent to the S-9 Pump Station to pump clean seepage back into the Everglades Protection Area.	2002	SFWMD
Pf02	Lake Okeechobee Tributary Sediment Dredging	The purpose of the Lake Okeechobee Tributary Sediment Dredging Project is to remove phosphorus in canals located in areas of the most intense agriculture in the Lake Okeechobee Watershed. This project includes the dredging of sediments from ten miles of primary canals within an eight-basin area in the northern watershed of Lake Okeechobee. The initial design assumes that the dredged material will contain approximately 150 tons of phosphorus.	2005	SFWMD
Ba	Everglades Construction Project (ECP)	The District and the FDEP have set in motion a program that forms a comprehensive and consistent set of strategies to carry out the requirements of the Everglades Forever Act.	2006	SFWMD
Pf03	Pineland and Hardwood Hammock Restoration (C-111 Basin)	The purpose of the Pineland/Hardwood Hammock Restoration Project is to restore hammocks to a portion of the Frog Pond which has been purchased by the District as part of the C-111 Project to restore the Taylor Slough portion of the Everglades. This activity includes restoring South Florida slash pine and hardwood hammock species on a 200-foot wide strip on each side of two miles of State Road 9336 from the C-111 Canal to the L-31W Borrow Canal (approximately 50 acres) and the establishment of two one-acre hammocks in low-lying areas on each side of the road within Miami-Dade County.	2006	SFWMD
Pf08	Taylor Creek/ Nubbin Slough Reservoir and STA	This project includes an aboveground reservoir with a total storage capacity of 50,000 acre-feet and a STA with a capacity of 20,000 acre-feet in the Taylor Creek/Nubbin Slough Basin.	2009	SFWMD
Operations and Maintenance				
Bf	Operations and Maintenance of ECP	The operations and maintenance of the ECP is mandated by the Everglades Forever Act. This includes costs associated with the operations and maintenance of canals, levees, pipes, culverts, pump stations, and monitoring test cells within the ECP.	Ongoing	SFWMD

Table 14. Activities Table for Core Objective WQ 1. (Continued)

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Regulation				
Ed	Everglades Works of the District Permitting	The Federal Settlement Agreement and the Everglades Forever Act mandate the implementation of the Everglades BMP Program for the EAA to control phosphorus. In addition, the Everglades Forever Act mandates additional regulatory programs to include other water quality parameters and to include additional basins.	Ongoing	SFWMD
Eg	Everglades Storm Water Program	The Everglades Storm Water Program (formerly known as the Non-ECP initiative) was mandated by the Everglades Forever Act. The purpose of this program is to ensure that water quality standards are met at all structures that the District controls which pump water into, through, or from the Everglades Protection Area. This will be achieved through implementing the Non-ECP Permit, a combination of regulatory analysis, water quality monitoring, water quality improvement strategies, and solutions such as BMPs, or construction projects. Other components of the program include an education campaign, and developing a method for reimbursement of expenditures through a special assessment.	Ongoing	SFWMD
Ic	Lake Okeechobee Works of the District Permitting	The purpose of this activity is to inventory and permit all nondairy land uses in the priority basins of the northern Lake Okeechobee Watershed. High phosphorus areas will be identified through water quality surveys, monitoring will be performed to ensure compliance with SWIM phosphorus discharge concentration limits, and corrective actions will be required on parcels that are out of compliance.	Ongoing	SFWMD
Monitoring and Evaluation				
Ff	Kissimmee Basin Data Collection and Evaluation	The 2000 Lake Okeechobee Bill requires an assessment of the sources of phosphorus from the Upper Kissimmee Chain of Lakes and their relative contribution to the water quality of Lake Okeechobee. In addition, data evaluation and assessment efforts need to be conducted to meet the TMDL and Minimum Flows and Levels (MFL) requirements.	2003	SFWMD
Bb	ECP Research and Data Collection	This activity represents the ongoing research and data collection efforts on behalf of the ECP. The Everglades Forever Act and Federal Everglades Settlement Agreement, as well as permits and other legislation mandates require the District to conduct research, monitoring, and modeling activities.	Ongoing	SFWMD
Eb02	Everglades BMP Effectiveness Research	BMP research provides information on how to efficiently control pollutant releases from agricultural and other developed areas. The particular focus of this activity is on the prevention of phosphorus releases. Projects include research on understanding phosphorus releases from the EAA soils to optimize fertilizer application rates, development of a baseline of water quality data for the C-139 Basin, evaluation of pesticide releases and toxicity, and evaluation of mercury releases and bioaccumulation. This activity will also develop a chapter on BMPs for the 2001 Everglades Consolidated Report, as required by statute.	Ongoing	SFWMD

Table 14. Activities Table for Core Objective WQ 1. (Continued)

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Eb11	404 Permit Research, Monitoring, and Modeling - Receiving Waters	This activity will assess impacts of effluents from STAs on water quality (nutrients and toxins), soils, periphyton, and macrophytes.	Ongoing	SFWMD
Eb20	Water Quality Monitoring - Florida Bay	This activity supports monitoring of water quality throughout the Florida Bay region and monitoring of seagrass community in northeastern Florida Bay, Manatee Bay, and Barnes Sound. Impacts of changing freshwater flow and releases from C-111 Canal are being assessed.	Ongoing	SFWMD
Ja	St. Lucie Estuary/ Indian River Lagoon	This program includes monitoring, research, and implementation within the portions of the St. Lucie Estuary and Indian River Lagoon that are located within the District. This program has a very direct tie to the Indian River Lagoon portion of the Comprehensive Everglades Restoration Plan (CERP), as well as the basis of scientific information being used to carry out the Indian River Lagoon SWIM implementation and PLRG development.	Ongoing	SFWMD
Ia	Lake Okeechobee Research and Data Collection	This element includes the research and monitoring related activities being conducted in Lake Okeechobee and its watershed. This information is then fed to the planning and implementation projects to ensure that the District's restoration related activities are based on sound and defensible science. The key activities include in-lake research devoted toward determining the impacts of water level, nutrients, and invasive plants; watershed research dealing with the fate and transport of phosphorus; modeling activities associated with the impacts of phosphorus in the watershed and the lake; BMPs associated with beef cattle operations; and monitoring activities to assess the effectiveness of the District's restoration efforts.	Ongoing	SFWMD
Kb	Water Quality Monitoring	This activity encompasses the ongoing water quality monitoring work performed by the District that does not relate to any specific project. Various activities within the element include water analysis, water sampling, and quality control.	Ongoing	SFWMD
Nd	Lower West Coast Water Quality Monitoring	This activity encompasses the Lower West Coast Estuarine Water Quality Monitoring from Cape Romano to Caloosahatchee River (Florida International University) and Big Cypress Basin Inland (Collier County) water quality monitoring projects.	Ongoing	SFWMD

Core Objective WQ 2: Protect and improve ground water quality

The SFWMD has developed strategies to meet this core objective. The strategies will be implemented via budgeted activities in the categories of Planning, Regulation, Outreach, and Monitoring and Evaluation (**Table 15**).

Performance Measures for Objective WQ 2

- **Core WQ 2(a):** Improving, degrading, and stable trends in ground water quality
- **Core WQ 2(b):** Improving, degrading, and stable trends in nitrate concentrations in springs

Table 15. Activities Table for Core Objective WQ 2.

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Core Objective WQ 2: Protect and improve ground water quality				
		Planning		
Pa06	Water Preserve Area Feasibility Study	This is a study to investigate the feasibility of an interconnected series of marshes, reservoirs, water quality treatment areas, ground water recharge areas, and storm water attenuation facilities between the natural Everglades system and the urbanized areas of the east coast of South Florida. This study includes modeling and studies of ground water flows, surface water flows, and water quality. The study will also determine specific uses of individual cells and develop plans for construction.	2001	SFWMD
		Regulation		
Hb01	Water Use, Application, Compliance, and Criteria Development	Water use permitting (Consumptive Use Permitting) is a state mandated program assigned exclusively to the water management districts. The objective is to insure safe, efficient, equitable, and reliable development of the state's water resources. The major components are 1) review and prepare recommendations for permit applications for all consumptive uses of water within the District boundaries; 2) provide postpermit compliance checks on priority projects based on staffing resources (approximately 300 projects per year); 3) review and issue well construction permits for specific water wells within District boundaries; and 4) perform water conservation rulemaking analysis and make recommendations. This activity also includes prepermit planning, permit issuance, dispute resolution, litigation support, technical support, enforcement, communication with water supply planning activities of this agency, and criteria and rule development.	Ongoing	SFWMD
		Outreach		
Ga01	Local Government Comprehensive Plans	Comprehensive plans and amendments are reviewed by the District as required by Chapters 163 and 298, F.S. This activity is being significantly cut back for FY2001 to provide funding for the CERP.	Ongoing	SFWMD

Table 15. Activities Table for Core Objective WQ 2. (Continued)

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Event Specific Code	Water Shortage Management	The Governing Board may declare a water shortage and enforce the associated restrictions when there is not enough water available for present or anticipated needs, or when a reduction in demand is needed to protect water resources. Ground water and surface water levels are continuously monitored. If they fall to levels considered critical for the time of year and anticipated demands, the water shortage process is initiated, pursuant to Section 373.246, F.S. Different levels of drought require corresponding levels of restrictions. Water shortage declarations range from a warning, which has voluntary moderate restrictions, through four phases of water shortage, to an emergency, which can disallow any further withdrawals.	As Needed	SFWMD
	Wellhead Protection Programs	The FDEP has a number of regulations under the Florida Administrative Code which function to regulate hazardous and solid waste, storm water discharges, storage tank systems, etc. The primary goal of these legislative policies is to prevent problems before they occur, as contrasted to correcting or providing remedial action for preexisting problems. The intent of these ordinances is to protect and safeguard the health, safety, and welfare of the public by providing criteria for regulating and prohibiting the use, handling, production, and storage of certain deleterious substances which may impair present and future Public Water Supply (PWS) wells and wellfields. The District has and will continue to provide assistance to local governments in the preparation of their wellfield protection ordinances.	Ongoing	FDEP
	Recharge Mapping	As directed by Chapter 373, F.S., the SFWMD provides ground water recharge information to local governments to assist them with the development and implementation of appropriate water resource policies. In order to accomplish this, the SFWMD undertook a project to map recharge areas within its four planning regions. This effort was completed in 1995. The maps delineate precipitation recharge and leakage rates for all the primary PWS aquifers utilized throughout South Florida. The District has and will provide assistance to local governments in the delineation of prime recharge areas in order to implement voluntary tax assessment programs (under the Bluebelt Act) that protect the state's prime recharge areas.	As Needed	SFWMD
Monitoring and Evaluation				
Hf01	Wetland Criteria Development Support	This activity supports the Regulation Program in developing a scientific basis for wetland protection criteria used in water use and environmental resource permitting. The activity was originated at the direction of the Governing Board and Executive Office to develop a research and monitoring program to investigate impacts. This information is needed to support rulemaking for the Lower West Coast and Upper East Coast regions and is a critical element in the implementation of water supply plans for both regions.	2003	SFWMD

Table 15. Activities Table for Core Objective WQ 2. (Continued)

FY2001 Budget Activity Code	Strategies	Description	Year Complete	Responsible Entity
Pe02	Lake Okeechobee Aquifer Storage and Recovery (ASR) Pilot Project	This pilot project will identify the most suitable sites for the ASR wells in the vicinity of Lake Okeechobee and identify the optimum configuration of those wells. Additionally, the pilot project will determine the specific water quality characteristics of waters to be injected, the specific water quality characteristics and amount of water to be recovered from the aquifer, and the water quality characteristics of the receiving aquifer. Further information from the pilot project will provide the hydrogeologic and geotechnical characteristics of the upper Floridan Aquifer System within the region, and the ability of the upper Floridan Aquifer System to maintain injected water for future recovery.	2004	SFWMD